NATOMAS DITCH SYSTEM, BLUE RAVINE SEGMENT Juncture of Blue Ravine and Green Valley Roads Folsom Vicinity Sacramento County California

HAER No. CA-144-A

HAER CHL 34-FOLSO.Y, 1A-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Western Region
Department of the Interior
San Francisco, California 94107

HISTORIC AMERICAN ENGINEERING RECORD

HAER CAL 34-FOLSON, IA-

NATOMAS DITCH SYSTEM, Blue Ravine Segment

HAER No. CA-144-A

Location:

The Natomas Ditch System is located in the eastern portion Sacramento County, east and south of the City of Folsom, California. The Blue Ravine Segment of the system is located to the southeast of the juncture of Blue Ravine and Green Valley Roads.

USGS Quad: Clarksville (7.5') 1953. Photorevised: 1980. Folsom (7.5') 1967. Photorevised: 1980. Township 10N Range 8E; Section 28, 29, 32, 33. Base (Mer) MD.

UTM Coordinates: Zone 10.

A: 664390E/4284160N; B: 664400E/4282090N; C: 663160E/4282070N;

D: 663140E/4284260N.

Date of Construction:

Initial construction began in 1853. The system was expanded and improved during the 1850s and 1860s. Extensive improvements and modifications also occurred between 1910 and 1920.

Present Owner:

The system is owned by private parties and state and federal agencies. The Blue Ravine segment forms the boundary between two private owners, The Parkway Venture and Homes by Damé.

Present Use:

Since the construction of Folsom Reservoir, the system no longer carries water from the American River. Instead, parts of the system, such as the Blue Ravine Segment, receive water via groundwater pumping.

Significance:

The Natomas Ditch System's significance comes from its role in the history and development of mining and agricultural endeavors in the Folsom area. The system was determined eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion A at the local level of significance as a discontiguous district. Its period of significance extends from 1853 to 1942. Segments that date to the period of significance and retain integrity have the potential to be eligible for inclusion in the NRHP. The portion of the main canal of the Natomas Ditch System that is within the boundaries of the Parkway Project retains sufficient integrity and has been determined to be

eligible for inclusion in the NRHP as a contributing element of a

discontiguous district.

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PART 1. INTRODUCTION

This report and the attached photodocumentation have been prepared to mitigate the adverse effects of the Parkway at Blue Ravine Project (Parkway Project) on a contributing segment of the Natomas Ditch System, a resource that has been determined eligible for listing in the National Register of Historic Places (NRHP). The Parkway Project and the contributing segment of the Natomas Ditch System are located in the eastern portion of the City of Folsom (Figure 1). This mitigation is being conducted in compliance with permit conditions imposed by the U.S. Army Corps of Engineers (Corps), pursuant to Section 404 of the Clean Water Act, Section 106 of the National Historic Preservation Act (NHPA), and a memorandum of agreement between the Corps, the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation. Figure 2 shows the points from which photographs were taken.

To comply with the requirements of the California Environmental Quality Act (CEQA) and Section 106 of the NHPA, a cultural resources inventory of the Parkway Project area and a preliminary determination of eligibility for the Natomas Ditch System was prepared by Peak & Associates in 1993 (Peak & Associates 1993a; 1993b). An environmental impact report for the project and an addendum determination of eligibility report was prepared by Jones & Stokes Associates (Jones & Stokes Associates 1992; 1993).

In 1993, the SHPO concurred that the Natomas Ditch System is eligible for inclusion in the NRHP under Criterion A at the local level of significance as a discontiguous district (Figures 3 and 4). Its period of significance extends from 1853 to 1942. Segments that date to the period of significance and retain integrity have the potential to be eligible for inclusion in the NRHP. The SHPO further concurred that the portion of the main canal of the Natomas Ditch System within the boundaries of the Parkway Project retains sufficient integrity to be eligible for the NRHP as a contributing element of a discontiguous district (Craigo pers. comm.). The following describes the historic context of the system, focusing on the main canal of the Natomas Ditch System and the NRHP-eligible segment of the main canal within the boundaries of the Parkway Project.

PART 2. DESCRIPTION

Construction began on the Natomas Ditch System in 1853; by 1860, the system totaled over 60 miles in length. The original system consisted of simple unlined ditches. Over the years, these canals were extensively modified, with many portions destroyed and others added or upgraded. It is estimated that approximately 29% of the system that is older than 50 years is still intact. Of that amount, 12% is under Folsom Reservoir (Jones & Stokes Associates 1993).

Originally, the main canal of the Natomas Ditch system brought water from the South Fork of the American River, from above Salmon Falls down through the American River canyon and into the Folsom area. As the canal exited the canyon, the system bifurcated, with the Mormon Island Branch proceeding west to the Mormon Island Diggings and the main canal continuing southward to the mining communities of Prairie Diggings, Willow Springs Diggings, and Rhodes Diggings. This portion of the main canal and the Mormon Island Branch are currently under Folsom Reservoir.

The main canal continued south through the Parkway Project area, terminating at Placerville Road. At this point, two smaller ditches were constructed: one proceeding west to Willow Springs Diggings, and the other, the Rhodes Branch, turning south and westward to the mines at Rhodes Diggings, about 3 miles southeast of Folsom, lying between modern U.S. Highway 50 and White Rock Road.

Within the Parkway Project boundaries, the main canal is earthen and unlined and about 3 meters wide, with a low earthen berm that varies in width from 1 to 5 meters. Within the project area, the Bunker Hill Branch diverged from the main canal and proceeded west to the mining areas near the city of Folsom.

The main canal and major branches of the Natomas Ditch System were in use through the mid-1950s. Many of the branch ditches had been cut off when mining ceased to be profitable in the outlying areas, and those small sections of ditches were removed from service and fell into disuse. The dredging of large portions of the Folsom region also resulted in the loss of many sections of branch ditches. The impoundment of waters within Folsom Reservoir in the 1950s caused the filling of several miles of the main canal. The diversion dam at Salmon Falls for the main canal was integral to the functioning of this system, allowing water to flow into the main canal. Without the diversion dam, the system is nonfunctional. Not operational after completion of Folsom Reservoir, the dam was destroyed in 1959.

Since the system ceased to function, the main canal within the Parkway Project's boundaries receives water from a well housed on the eastern side of the ditch, within the Russell Ranch project area. This portion of the main canal terminates under a residential development but reemerges at the other end for a short distance before it joins the Rhodes Branch.

PART 2. HISTORICAL INFORMATION

Water Conveyance Systems and the Development of Central California

The construction of water conveyance systems in central California is the result of several physiographic features that combine in the region. The foothills of the Sierra Nevada contain some of the most productive gold-bearing deposits ever found. These mineral deposits vary greatly in topography, extending from low rolling hills at the edge of the Central Valley to steep mountains. Gold is found in placer and quartz deposits, both of which require water to make the extraction of the gold more productive.

Central California's water supply is restricted to the drainages of numerous large rivers. These rivers obtain their water from precipitation, which falls primarily from October to March, with most of it concentrated in December, January, and February. As a result of these factors, the need to control and transport water more effectively became a primary goal in the early development of central California.

Following the discovery of gold in the Sierra Nevada foothills in 1848, thousands came to foothill region seeking their fortunes. Early miners sought out the readily available placer gold along rivers and streams. As this gold played out, the miners employed other methods to extract placer gold from the rich deposits. Water was diverted from the year-round drainages and used to wash the gold-bearing deposits (Paul 1947; Young 1970).

Gold was found away from water sources and worked either seasonally or as "dry diggings". To maximize yield, water was needed to separate the gold from the dirt and rock. Water was also necessary for the processing and milling of the ores obtained from quartz mining, and soon, the need for permanent, year-round water sources away from the drainages became acute.

As the easily obtainable gold became scarce, many miners recognized the area's agricultural potential and began to settle in the region. As with mining, the availability of water was a major factor affecting agricultural productivity. Enterprising individuals realized that supplying water to mining and agricultural operations could yield greater profits than could be derived from farming to working the sluice boxes or gold pans.

As mining became more capital-intensive, companies formed to exploit the deeper placers, work the river placers on a larger scale, and develop quartz mines. In April 1850, a state act was passed that allowed the incorporation of companies for manufacturing, mining, mechanical, or chemical purposes. For the first time, companies had the capital to construct large water conveyance facilities (Paul 1947).

Numerous ditch systems were constructed throughout the Sierran gold belt during the early to mid-1850s. Ditch systems that date to this period usually consisted of one or more

reservoirs with either log, rock, earthen, or rock and fill dams for diverting and impounding the water. The unlined, earthen ditches wound through the region, gradually dropping in elevation. At points where the ditches intersected with streams, drainages, or ravines, wooden flumes were constructed to carry the water, maintaining the gradient. The flumes varied in size, but many needed to span wide ravines and required major engineering efforts (Clark 1970; Paul 1947).

These water conveyance systems changed through time, with ditches added or abandoned and connections made with other systems, as the needs of the water users changed or new gold discoveries were made. Flumes were made shorter or were replaced by ditches to decrease water loss. Technological advances in mining techniques also required ditch systems to be altered.

Although the primary purpose of the ditches in the early years was to provide water for placer mining, some use for agricultural purposes did occur during this period. By 1855, the rich surface placers were largely exhausted, and river mining accounted for much of the gold production in the state in the 1860s. By 1864, California's "gold rush" had ended. Both the rich surface and river placers were largely exhausted. Hydraulic mining provided the chief source of California's gold production for the next 20 years (Clark 1970:7).

In the last decades of the 19th century, gold mining gave way to agriculture as the primary economic pursuit in central California, and many ditch systems were used largely for agricultural purposes. Another shift occurred around the turn of the century when technological advances enabled large-scale dredging. After this time, many ditches were used for agriculture and to supply water for mining activities.

The Natomas Ditch System

In late 1851, Amos P. Catlin, a lawyer residing at the mining town of Mormon Island on the South Fork of the American River, organized the Natoma Water Company. The company proposed taking water from the South Fork of the American River near Salmon Falls through canals to the mining areas below to provide a year-round dependable water supply. In December 1851, the Natoma Water Company filed a Notice of Appropriation in Sacramento County and a Mining Location in El Dorado County for the water it would need from the South Fork. Several months after posting its initial notice of intent to drain the American River at Mormon Island, the Natoma Water Company began using the name of Natoma Water and Mining Company (Plimpton n.d.a).

On March 16, 1852, the Natoma Water Company posted another Notice of Appropriation. This time the company specified Rocky Bar, about 2 miles above Salmon Falls in El Dorado County, as the exact location for its diversion point on the river. The contract for the construction of the dam and main canal was let to Brooks, Clark & Company of Coloma on July 19, 1852, with the completion date set for November 15, 1852.

A letter to the editor of the Sacramento Union in October 1852 described the contract and the construction that was underway. The contractors were to receive half of the contract amount in cash and half for the water delivery receipts upon completion. The contract for the construction was said to exceed \$100,000.

The main canal was 5 feet wide, 8 feet on top, and 3 feet deep. Flumes were 6 feet wide and 3 feet high. The average grade of the canal was 4 feet to the mile. Early rains prevented the completion of the contract by the scheduled date. The dam, almost completed, was completely destroyed by the runoff. The system was finally completed to Mormon Island on May 1, 1853. Another contract was issued to the same company to complete the extension of the canal to Rhodes Diggings (Plimpton n.d.a).

During the succeeding months, the Natoma Water Company completed its lateral canals, built a dam at Alder Creek, and turned water into its dry mining claims, ditches, and dams for individual miners and smaller companies along the South Fork of the American River. These improvements were incorporated into the company's system. Operating in two counties, Natoma Water Company's 16 miles of main trunk and fifty miles of branch ditches carried water to between 1,000 and 2,000 thousand miners along its canal and branches, which the company divided into the following 13 sections: Rocky Bar, Pennsylvania Flat, Higgins Point, McDowell Hill, Negro Bar, Red Bank, Mormon Island, Willow Springs, Rhodes Diggings, Alder Creek, Rebel Hill, Prairie City, and Tates Flat. To conserve all possible water, Natoma Water Company built 12 small reservoirs for storage of local runoff and for emergency use in the event of breaks in the main canal (Casteñada et al. 1984).

Completion of Natomas Water Company's system gave new economic life to the area. Willow Springs, near the end of the main canal, was on a ridge between Willow and Alder creeks. Mining began there in 1851 but did not flourish until 1853 when the canal reached the ridge. At the height of mining, 12 mining companies, employing 60 men, operated profitably at Willow Springs.

Although the Natoma Water Company sold water for early milling, manufacturing, and agricultural purposes, the bulk of its sales were for mining. Water was sold by the "miner's inch", an arbitrary measure consisting of the quantity of water that will flow through a 1-square-inch hole during a 10-hour period (Young 1970).

With completion of its diversion system, a near monopoly of water rights along the South Fork of the American River, extensive water sales, and rising stock sales, the Natoma Water Company became one of the most successful early water companies in the northern foothills. The Natoma Canal was a "magnificent work" according to the San Francisco Bulletin. The Sacramento Pictorial Union observed in July 1853 that "... the Natoma Water and Mining Company will be one of the most profitable investments in California" (Casteñada et al. 1984).

From the beginning, a number of subscribers who obtained water from the canal used the water for agricultural purposes. Two of the earliest customers were Jacob and Oswald Broder, who mined in the region then settled on their lands in the Natoma Valley in 1853. Oswald Broder had a vineyard and orchard on the lands that now are a portion of the proposed Parkway at Blue Ravine project area. In El Dorado County, there were a number of early vineyards irrigated with water from the Natomas Ditch system.

In 1854, the organizers of the Natoma Company formed the American River Water and Mining Company. This new company built the North Fork Canal on the North Fork of the American River.

While other ditch companies succumbed during the rise of capital-intensive industrial mining, the Natoma Water Company survived by expanding its resource base and investing its profits in real estate. Natoma Water Company's survival was also due to efficient management. Although the company attracted some urban and outside investors, actual control remained at the local level, particularly in the hands of Catlin and Augustus T. Arrowsmith, who held the largest number of shares. Catlin retained the presidency and ran the company until 1864, when he sold all of his stock, though he remained as its attorney for several years afterward. In the daily operations, Catlin relied heavily on Arrowsmith, Natoma's capable engineer and superintendent. The two also largely directed the American River Water and Mining Company's operation on the North Fork of the American River.

Under the management of Catlin and Arrowsmith, the Natoma Water Company acquired part of the Rio de los Americanos grant in Granite Township, with the intent of offsetting declining water profits through real estate speculation. Due partly to its geographical location, Folsom became one of the most prosperous towns in the state. The new town, as Joseph Folsom had intended, became an important transportation center and supply depot, and was the hub of California's first railway system, with branch lines to Lincoln, Auburn, and Placerville (Casteñada et al. 1984).

In 1862, one of the stockholders in the company, Horatio G. Livermore, began purchasing more of the stock to acquire the controlling interest in the company. Livermore's interest in the company was in the development of the river's wasted power rather than in the mining/agricultural water supply pursuits then followed by the company. In 1865, Catlin sold his shares to Livermore (Plimpton n.d.a).

Livermore redirected Natoma Water Company's resources and diversified its holdings, moving from mining to agriculture, hydroelectricity, and electric railway systems; incorporated new companies; and transferred some of the company's holdings to new enterprises. To Livermore, Natomas Water Company's canal system and land base provided the ideal opportunity for creating a new market for water by developing the wasted power of the American River for manufacturing purposes. The company owned 16 miles of main canal, 50 miles of branch ditches, and a number of reservoirs and flumes, along with clear title to extensive appropriative and riparian water rights. The system, which had just been

entirely cleaned out and repaired, could function in its present condition and be converted to water power production in due time.

Although the company was still earning a profit, the returns from water sales decreased yearly, hitting a low of \$15,787.94 for fiscal year 1863-1864. High maintenance and repair costs, no returns on the land purchase, and legal expenses exacted a heavy toll on the Natoma Company's revenue from water sales. In addition, the supply of water was beginning to exceed demand, particularly for river mining.

The vast disparity between the original costs and assessed value of the canal was due to the high cost of capital, labor, and materials when the system was built in 1853-1854 and prices of labor and materials in 1860-1865, which were considerably lower. In the same vein, expectations of a continued boom had kept land prices high in the 1850, but by the mid-1850s, with the decline of mining and subsequent loss of population, the real estate market plummeted. These conditions enabled Livermore to acquire control of Natoma Water Company's system and properties for a fraction of their original cost (Casteñada et al. 1984).

In 1868, a new dam was built at the site of the previous dams. This dam, stretching 298 feet across the river and standing 16 feet high, stood until the Corps demolished it in 1959 as a hazard to boating at Folsom Reservoir.

When the new Salmon Falls Dam was nearing completed in 1868, state prison officials accepted the Natoma Water Company's offer of 350 acres in exchange for prison labor. Complicated negotiations and innumerable delays kept Livermore's plans for a dam at Folsom and proposed manufacturing center in limbo for over 20 years. Meanwhile, the company had to keep operating. Because three-quarters of the company's mineral land was already worked out and abandoned and water rents for mining were limited to about 30 sluice claims, the company had to find other ways to use its resources to remain in business.

While developing its vineyard, winery, orchards, and drying operations in the 1870s, the Natoma Water Company also planted some acreage to wheat and barley and continued to repair, improve, and expand its old canal system. Not only was the canal system central to irrigation for agriculture, the company had definitely not given up plans to develop the river for water power (Casteñada et al. 1984).

Horatio G. Livermore died in 1879, and his sons took over the company. Their accomplishments, especially the construction of the Folsom Powerhouse, are documented at great length in several general works (Barrows 1966).

Much work was done on the system in 1880 and by the end of the year, the company's 16-mile main canal had a capacity of 3,500 miner's inches. Improvements included a spectacular new "high flume" across New York Ravine, which was 1,791 feet long, standing 83 feet tall (Plimpton n.d.a). At this time, many of the old flumes, recently rebuilt,

were "banked in" and shortened. The "high flume" was one of four flumes on the main canal that measured over 1,000 feet in length.

By 1885, the Natoma Company had developed over 2,000 acres in vineyards, 300 acres in orchards, and 800 acres in hay and grain. At the time, this was the second largest vineyard in the United States. Grape stakes for the vineyard were made from wood salvaged from the old flume over New York Ravine.

At this time, an estimated 100 Chinese and 50 Euroamerican workers were employed by the company. To compensate for the loss of water sales due to the decline in mining, the company expanded its orchards and vineyards. In 1890, the company was irrigating 500 acres of crops and had 8,454 acres of land in fruit and vineyards. Three years later, the company employed 300 men on the fruit picking line. The company produced 200,000 gallons of port wine and 100,000 gallons of brandy (Plimpton n.d.a).

In the late 1890s, the development of inexpensive power sources to run the equipment made large-scale gold dredging economically feasible. To provide the water necessary for the operation of the dredgers, the Natomas Ditch System was enlarged and altered. The main canal had only been subject to maintenance work and repair since the 1868 completion of the dam at Salmon Falls, and the loss of water from leaks had become a problem.

In 1912, improvements to reduce seepage and increase the efficiency of the system was undertaken. The dam was overhauled and strengthened: 13,000 feet of the ditch were lined with concrete with much of the remainder puddled with clay, and flumes were replaced and re-engineered. Upon completion in 1914-1915, the capacity of the ditch had been restored to the original 3,000 miner's inches of water. A local paper described the renovation as so complete that the term "new canal" could be used to describe the ditch (Plimpton n.d.a).

The Natomas Consolidated Company was incorporated in 1908 to combine the various dredging operations in the region and to acquire other lands for dredging. The company's mining activities were also supplemented by rock and gravel operations on the dredged areas (Plimpton n.d.a).

The Natomas Company was forced to halt operations in 1942 because of War Production Board Limitation Order L-208 (Clark 1970). The Natomas Company was granted special permission to resume operations on a limited scale in early 1943. After the end of the war, the company went back into full-scale production. From 1946 to 1952, the Natomas Company was the leading gold producer in California. In the 1950s, the Natomas Company continued dredging operations in the region. The last dredger operating in the American River region near Fair Oaks halted operations in 1962.

The company began selling tracts of dredged land, with a large tract sold to the government during World War I for Mather Field. In 1951, the company sold 7,500 acres to Aerojet-General Corporation and eventually sold a total of 13,000 acres of dredged land to that corporation.

The completion of Folsom Dam in 1956 ended the use of the Natomas Ditch System. The Mormon Island Auxiliary Dam at Blue Ravine cut off the main ditch. A pipeline and siphon were installed to deliver impounded water from Folsom Dam to the ditch at a point below Mormon Island Dam, crossing the Parkway Project area. The features of the system within Folsom Reservoir pool have been inundated and silted in. The head dam of the system above Salmon Falls remained intact until 1959. The dam was reportedly destroyed because it was a hazard to boating (Plimpton n.d.a).

The completion of Folsom Reservoir also brought about the increased spread of industry and suburban development in eastern Sacramento County. In the 1980s, growth in the county extended to the eastern boundary, causing an accelerated rate of growth in the Folsom region. This rapid growth has caused the conversion of the landscape from vast open, agricultural areas and fields of dredger tailings to a modern developed community.

National Register of Historic Places Eligibility

The SHPO has concurred that the Blue Ravine Segment of the Natomas Ditch System retains integrity of location, design, materials, and workmanship. Although residential development has encroached on its rural setting, from many vantage points, this segment still conveys much of the historical feeling and association of the Natomas Ditch System. Specifically, it is still possible to observe the ditch as it follows the contours across the rural landscape. Nearby pasture or fallow agricultural fields, historic buildings, mining features, and views of open, rolling hills complete the rural setting. This segment of the ditch still carries water, although not from its original source.

Numerous smaller ditches are located within the Parkway Project boundaries. These branches carried water from the main ditch to the various "diggings" on the property. Although these ditches are older than 50 years in age, they do not illustrate the same significant qualities as the segment of the main canal and do not contribute to the NRHP district.

PART 3. SOURCES OF INFORMATION

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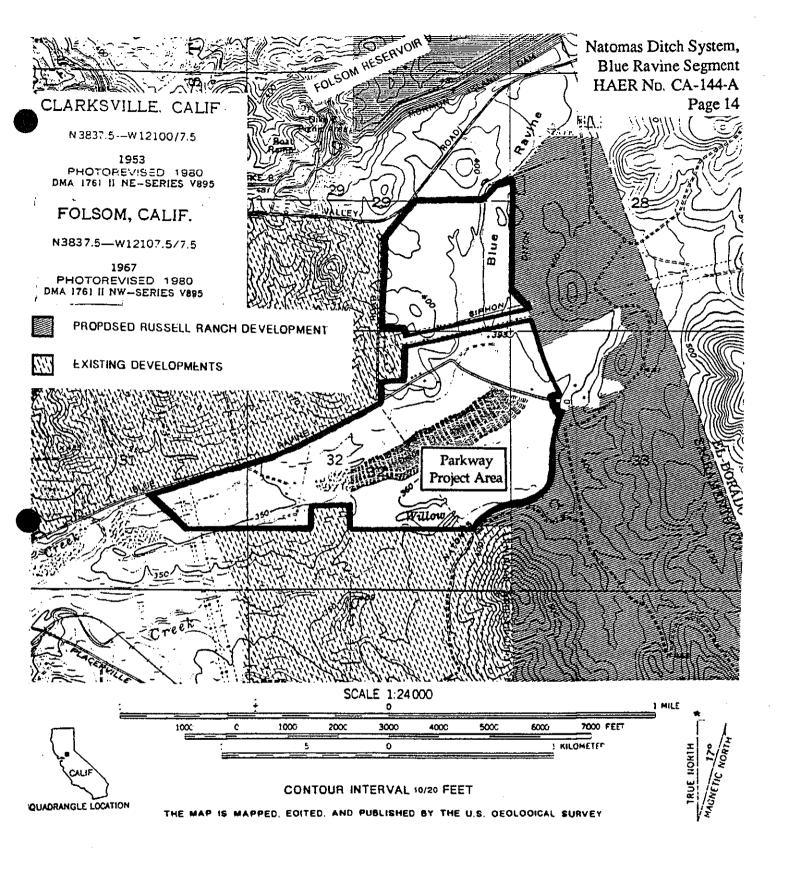
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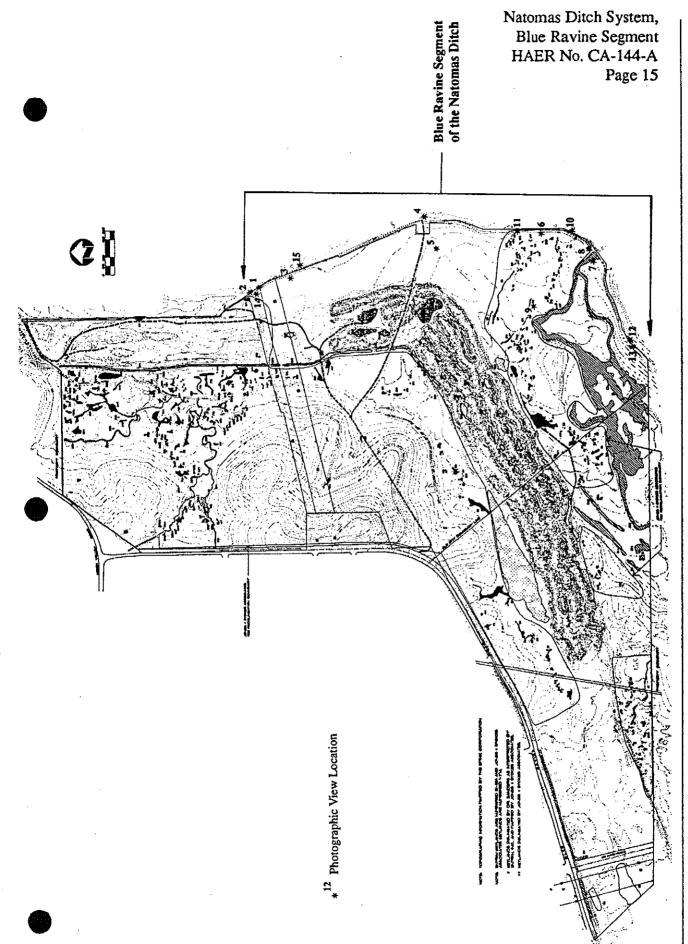
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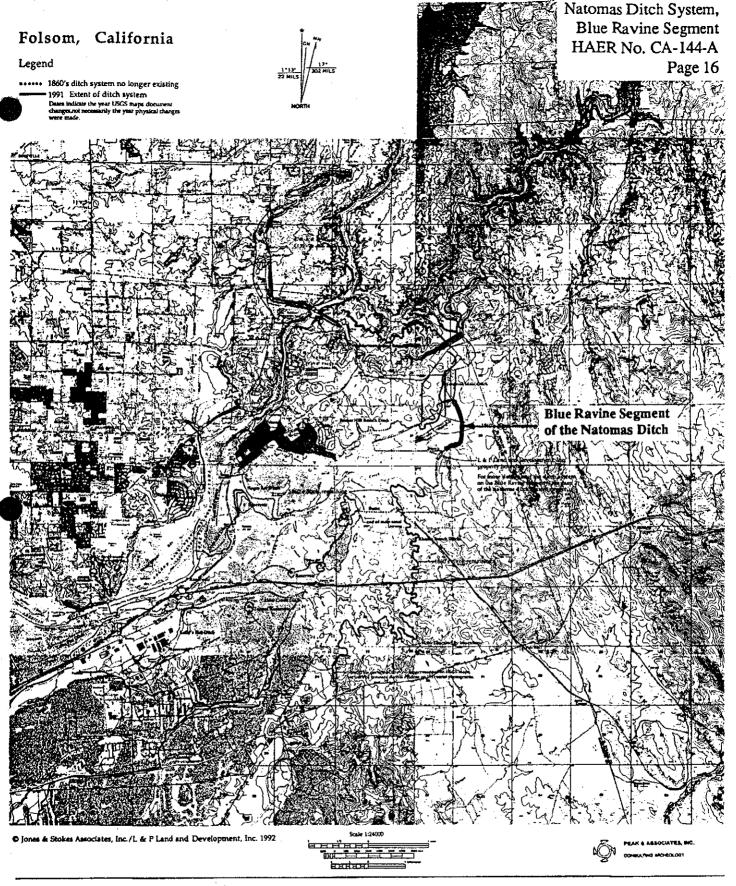
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Contributing and Non-Contributing Sigments of the Natomas Ditch System National Registers District within The Parkway Project Boundary

Jones & Stokes Associates, Inc.

